04-ESQ-0267

U.S. Department of Energy
Office of River Protection
Mr. R. J. Schepens
Manager
P.O. Box 450, MSIN H6-60
Richland, Washington 99354

CCN: 105730

DEC 0 1 2004

Dear Mr. Schepens:

CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL OF DECISION TO DEVIATE FROM THE AUTHORIZATION BASIS FOR THE HANFORD TANK WASTE TREATMENT AND IMMOBILIZATION PLANT (24590-HLW-DTD-ENS-04-0010, REVISION 0)

The purpose of this letter is to provide notification to the U.S. Department of Energy (DOE), Office of River Protection (ORP) of a decision to deviate (DTD) from the authorization basis for the Hanford Tank Waste Treatment and Immobilization Plant. This DTD is being processed in accordance with the Preliminary Safety Analysis Report and project procedures. This letter satisfies the 72-hour written notification requirement.

DTD 24590-HLW-DTD-ENS-04-0010, Revision 0, describes a deviation from the *Preliminary Safety Analysis Report to Support Construction Authorization; HLW Facility Specific Information,* 24590-WTP-PSAR-ESH-01-002-04, Revision 1a.

The specific deviation from the authorization basis describes the elimination of the Ammonia tank in the High-Level Waste Facility, the addition of an air line to the Ammonia addition system, and the assessment of the impact of the Ammonia Nitrate buildup in the Offgas System.

This DTD is necessary to avoid schedule impacts associated with the issuance of design media.

Safety Evaluation 24590-WTP-SE-ENS-04-0208, Revision 0, is included as an attachment to the DTD. Project procedures require that an Authorization Basis Amendment Request (ABAR) reconciling deviations be sent to DOE for approval within 30 days of the DTD approval.

This DTD will be tracked in the Recommendation and Issues Tracking System to ensure attention to process and closure schedules.

BECHTEL NATIONAL, INC.
2435 Stevens Center Place
Richland, WA 99352
tel (509) 371-2000

CCN: 105730

Please contact Mr. Mark Platt at 371-3365 for any questions or comments on this transmittal.

Very truly yours,

J. P. Henschel
Project Director

TBR/slr

Attachment - Decision to Deviate 24590-HLW-DTD-ENS-04-0010, Revision 0, plus accompanying Safety Evaluation 24590-WTP-SE-ENS-04-0208, Revision 0

cc:

Allen, B. T. w/a	WTP	MS7-BSW
Armstead, J. M. w/o	WTP	MS14-3B
Beranek, F. w/o	WTP	MS4-A1
Clements, W. T. w/o	WTP	MS12-2A
Eschenberg, J. w/a	ORP	H6-60
Garrett, R. L w/o	WTP	MS4-A1
Gibson, K. D. w/a	WTP	MS4-B1
Hanson, R. L. w/a	WTP	MS12-2B
Henschel, J. P. w/o	WTP	MS14-3C
Keuhlen, P. J. w/o	WTP	MS7-ANW
Lawrence, R. E. w/o	WTP	MS8-A
Lowry, P. w/a	WTP	MS7-ESW
Medsker, M. A. w/a	WTP	MS12-2B
Miller, L. F. w/a	ORP	H6-60
Pisarcik, D. J. w/a	WTP	MS4-A2
Platt, M. A. w/a	WTP	MS4-B1
Rogers, C. E. w/o	WTP	MS14-3C
Ryan, T. B. w/a	WTP	MS4-B1
Sautman, M. T. w/a	DNFSB	A5-17
Schuetz, P. W. w/o	WTP	MS5-I
Short, J. J. w/o	ORP	H6-60
Spezialetti, W. R. w/o	WTP	MS4-B1
Tosetti, R. J. w/o	WTP	MS4-A2
Woolfolk, S. W. w/a	WTP	MS5-G
DOE Correspondence Control w/a	ORP	H6-60
PDC w/a	WTP	MS11-B

Decision to Deviate
24590-HLW-DTD-ENS-04-0010, Revision 0, plus
Accompanying Safety Evaluation
24590-WTP-SE-ENS-04-0208, Revision 0

Decision to Deviate from the Safety Envelope

DTD No: 24590-HLW-DTD-ENS-04-0010 Rev No: 0

The approvers of this form have determined that it is critical to project progress to temporarily deviate from the safety envelope as allowed in RL/REG-97-13. This temporary situation will be corrected no later than 90 days from the date this form is approved by the Area Project Manager. Environmental and Nuclear Safety (E&NS) is responsible for notifying DOE verbally within 24 hours, and in writing (including a copy of this form) within 3 working days, after the DTD is approved.

Safety Evaluation No. 24590-WTP-SE-ENS-04-0208, Rev 0

Identify the specific design changes that are not in compliance with the safety envelope (include the document numbers of affected design documents).

This Decision to Deviate addresses the elimination of the Ammonia tank in HLW, the addition of an air addition line to the Ammonia addition system, and the assessment of the impact of Ammonia Nitrate buildup in the Offgas System (PNNL Report WTP-RPT-133). The ISM conducted to evaluate these changes determined that the following two new controls are necessary:

1 The addition of a control (orifice) to restrict the flow of Ammonia into HLW,

2 The addition of an automatically Ammonia injection isolation control if low dilution airflow is detected.

These two new controls were documented and classified ITS SSCs as follows:

1 SCR-HPIPN/N0027 - Design Feature: Passive flow restriction device (Flanged Orifice) to be installed in the Ammonia transfer line from BOF to HLW to limit the transfer of Ammonia to no more than 125% of the flow required for the TOC/SCR unit. While this is a Design Feature, it was credited in the ISM as SS.

2 SCR-HINST/N0039 - Isolation valve to isolate Ammonia injection into Thermal Catalytic Oxidizer/Reducer unit on low air flow into Ammonia injection line is classified as SS. *(added per CCN 094230) This control will isolate the Ammonia addition on low dilution airflow to prevent the potential addition of Ammonia in the explosive range (16-25%) and the ignition temperature is ~651° C (Table 11-10, Lang's Handbook 13th Edition).*

In addition, two existing ITS SSC were reclassified:

The control to stop injection of Ammonia if low temperature in the selective catalytic reduction unit is detected is reclassified from SDS to APC (SCR-HINST/N0028). *(classified per CCN 078558) This control is necessary to prevent the buildup/formation of Ammonium Nitrate on Offgas components downstream of the Thermal Catalytic Oxidizer/Reducer unit.*

1 The requirement for the Offgas treatment system to maintain a negative pressure with respect to the C5 cell is reclassified from SDS to APC (SCR-HPVV/N0015). (classified per CCN 078554) *This control is necessary to maintain Offgas depression with respect to the C5 ventilation system and is reclassified from SDS to APC.*

These changes are in accordance with recent DOE Std. 3009 ISMs.
See attached safety evaluation 24590-WTP-SE-ENS-04-0208, Rev 0.

Affected Design Documents (when issued)		
Number	**Rev.**	**Title**
24590-WTP-3PS-MBTV-T0001	0	Engineering Specification for Thermal Catalytic Oxidizers/Reducers
24590-HLW-MKD-HOP-00019	1	HLW Catalytic Oxidizer / Reducer
24590-HLW-MKD-HOP-00020	1	HLW Catalytic Oxidizer / Reducer
24590-HLW-M6-HOP-00003	1	P&ID - HLW Melter Offgas System Melter 1 Secondary Offgas Treatment Sheet 1 of 2)
24590-HLW-M6-HOP-20003	1	P&ID - HLW Melter Offgas System Melter 2 Secondary Offgas Treatment Sheet 1 of 2
24590-HLW-M6-HOP-00008	1	P&ID - HLW Melter Offgas System Melter 1 Secondary Offgas Treatment Sheet 2 of 2
24590-HLW-M6-HOP-20008	1	P&ID - HLW Melter Offgas System Melter 2 Secondary Offgas Treatment Sheet 2 of 2

Decision to Deviate from the Safety Envelope

DTD No: 24590-HLW-DTD-ENS-04-0010 Rev No: 0

Affected Design Documents		
Number	**Rev.**	**Title**
24590-HLW-3YD-HOP-00001	0	Systems Description for HLW Melter Offgas Treatment Process and Process Vessel Vent Extraction (HOP and PVV Systems)

Planned Design Documents*		
Number	**Rev.**	**Title**

* These documents have not been issued at the time the DTD is issued, but it is anticipated these will be issued during the 90-day window.

Describe the specific deviation from the safety envelope associated with implementing the change. Identify the AB document(s) and the affected section(s).

See Description section above.

Affected AB Documents			
Number	**Rev.** 11/18/04	**Title**	**Section**
24590-WTP-PSAR-ESH-01-002-04 (as represented by 24590-WTP-SED-ENS-03-002-04)	01a 0j	Preliminary Safety Analysis Report to Support Construction Authorization; HLW Facility Specific Information (as represented by the SED, HLW)	3.3.5, Table 4A-2, Table 3A-9, Table 3A-24

In addition to the Safety Evaluation referenced above, perform an evaluation to determine the following:

☒ The specific design changes do not cause or threaten imminent danger to the workers, the public, or the environment from radiological, nuclear, or chemical hazards.

Prepared by:

Mark Mansell — *Print/Type Name*

Mark Mansell — *Signature*

11/18/04 — *Date*

11/18/04

Decision to Deviate from the Safety Envelope

DTD No: 24590-HLW-DTD-ENS-04-0010 Rev No: 0

Decision to deviate from the safety envelope concurred with by:

Eric Isern		11/18/04
ADS / DEM Staff Supervisor *(Print/Type Name)*	*Signature*	*Date*
Fred Beranek	for	11/24/04
E&NS Manager *(Print/Type Name)*	Signature	*Date*

NOTE: E&NS is responsible for the 24-hour verbal and 3-day written notifications to DOE-OSR as described above.

Decision to deviate from the safety envelope approved by:

John Schneider		11/24/04
APEM / DEM *(Print/Type Name)*	*Signature*	*Date*
Phil Schuetz		11/24/04
Area Project Manager *(Print/Type Name)*	*Signature*	*Date*

Attachment: Safety Evaluation 24590-WTP-SE-ENS04-0208, Rev. 0

Safety Evaluation For Design

Safety Evaluation No.:	24590-WTP-SE-ENS-04-0208	Rev. # 0
EDR No.:	24590-WTP-EDR-ENS-04-1547 and 1587	Rev. # 0
Design Documents Evaluated:	24590-HLW-DTD-ENS-04-0010	Rev. # 0
Consists of Parts: ☒ 1 ☐ 2		
Title: Safety Screen for Thermal Catalytic Oxidizer/Reducer Procurement Revision		

Part 1 Safety Evaluation

Complete Part 1 for all design changes requiring this form. Refer to Appendix 4 of 24590-WTP-GPP-SREG-002 for guidance. Part 1 determines whether the design change requires an ABAR. For all questions, provide a "Basis" for the answer in sufficient detail that a knowledgeable individual can identify the technical issues considered and the basis for the determinations. If the answer to questions 2, 3, or 4 is "Yes", an ABAR is required. "Broad scope" and SRD changes also require an ABAR. A "Yes" answer to questions 5 or 6 means that the design change is unacceptable and must be withdrawn and re-engineered. For any change that does cause an SED change, prepare a redline markup of the applicable sections of that document. For BNI-approved changes, print the SE, sign, obtain concurrence signatures, including the affected FNS Supervisor or Regulatory Safety Manager, and return the form to the design document originator for forwarding to PDC with the evaluated design document. Provide a copy of an original of the completed SE and SED redline markup to the E&NS AB Coordinator.

***Note:** The SED represents the currently approved PSAR safety envelope sections, plus approved changes.*

Description of change:

This Safety Evaluation addresses the elimination of the Ammonia tank in HLW, the addition of an air addition line to the Ammonia addition system, and the assessment of the impact of Ammonia Nitrate buildup in the Offgas System (PNNL Report WTP-RPT-133). The ISM conducted to evaluate these changes determined that the following two new controls are necessary:

1 The addition of a control (orifice) to restrict the flow of Ammonia into HLW,

2 The addition of an automatically Ammonia injection isolation control if low dilution airflow is detected.

These two new controls were documented and classified ITS SSCs as follows:

1 SCR-HPIPN/N0027 - Design Feature: Passive flow restriction device (Flanged Orifice) to be installed in the Ammonia transfer line from BOF to HLW to limit the transfer of Ammonia to no more than 125% of the flow required for the TOC/SCR unit. While this is a Design Feature, it was credited in the ISM as SS.

2 SCR-HINST/N0039 - Isolation valve to isolate Ammonia injection into Thermal Catalytic Oxidizer/Reducer unit on low air flow into Ammonia injection line is classified as SS. *(added per CCN 094230) This control will isolate the Ammonia addition on low dilution airflow to prevent the potential addition of Ammonia in the explosive range (16-25%) and the ignition temperature is ~651° C (Table 11-10, Lang's Handbook 13th Edition).*

In addition, two existing ITS SSC were reclassified:

1 The control to stop injection of Ammonia if low temperature in the selective catalytic reduction unit is detected is reclassified from SDS to APC (SCR-HINST/N0028). *(classified per CCN 078558) This control is necessary to prevent the buildup/formation of Ammonium Nitrate on Offgas components downstream of the Thermal Catalytic Oxidizer/Reducer unit.*

2 The requirement for the Offgas treatment system to maintain a negative pressure with respect to the C5 cell is reclassified from SDS to APC (SCR-HPVV/N0015). (classified per CCN 078554) *This control is necessary to maintain Offgas depression with respect to the C5 ventilation system and is reclassified from SDS to APC.*

These changes are in accordance with recent DOE Std. 3009 ISMs.

		N/A	YES	NO
1.	Does the change affect the safety envelope (SRD and applicable facility SED[s]), or is it a "broad scope" change? (Do not answer this question if already answered on corresponding safety screening/EDR)	☐	☒	☐

Safety Evaluation For Design

Safety Evaluation No.:	24590-WTP-SE-ENS-04-0208	Rev. # 0
EDR No.:	24590-WTP-EDR-ENS-04-1547 and 1587	Rev. # 0

		N/A	YES	NO
	Basis: These changes require modifications to the SED. The three SCRs identified in the description of change above will be specifically identified in the SED. Further, Sections 3.3.5, Table 4A-2, Table 3A-9, and Table 3A-24 of the SED will require modification.			
2.	Does the change create a new DBE?		☒	☐
	Basis: New DBEs are created in association with these changes. The added ITS SSC to restrict the flow of Ammonia addition coming into the HLW facility was identified as a result of the performance of the DOE Std. 3009 ISMs. The added ITS SSC to isolate the Ammonia addition on loss of dilution air (SCR-HINST/N0039) is a result of the evaluation of the impacts of Ammonium Nitrate formation in the Carbon Bed Adsorber in association with fire scenario evaluations. The change that reclassifies the control, which isolates Ammonia injection on low temperature in the Thermal Catalytic Oxidizer/Reducer unit, from SDS to APC is a result of the performance of DOE Std. 3009 ISMs. The change that reclassifies the control, which requires Offgas treatment to maintain a negative pressure with respect to the C5 cell, from SDS to APC is a result of the performance of the DOE Std. 3009 ISMs.			
3.	Does the change result in more than a minimal (≥ 10 %) increase in the frequency or consequence of an analyzed DBE as described in the SED?		☒	☐
	Basis: The HLW Ammonia source is now supplied by piping from a tank outside and away from the HLW facility and this tank services both the LAW and HLW Facilities. The Ammonia release DBE requires a revision to reflect elimination of the HLW Ammonia tanks (see section 3.4.1.12 of the HLW Safety Envelope Document, 24590-WTP-PSAR-ESH-01-002-04). Removing the Ammonia tank from HLW eliminates all Ammonia release events associated with the tank. The reclassification (reduction from SDS to APC) of the control to stop injection of ammonia on low temperature in the Thermal Catalytic Oxidizer/Reducer may result in an increase in frequency of an analyzed DBE in the SED. It is premature to ascertain that the maintenance frequency of SC/SS components will for certain be different than APC components; however, it is expected. This is due to the change in reliability of SSC being directly related to their maintenance/testing frequency. The maintenance/testing program is not mature enough to support an otherwise less conservative position. The reclassification (reduction from SDS to APC) of the control for the Offgas treatment system to maintain negative pressure with respect to the C5 cell may also result in an increased frequency of an analyzed DBE in the SED for the reason stated above. The addition of a control to restrict the flow of Ammonia addition coming into the HLW facility is expected to reduce the frequency and consequence of an Ammonia release into the HLW facility. The Facility Worker severity level is not expected to change and will be High (above threshold for Ammonia leaks).			
4.	Does the change result in more than a minimal decrease in the safety functions of important-to-safety SSCs or change how a Safety Design Class, Safety Class, or Safety Significant SSC meets its respective safety function?		☐	☒

Safety Evaluation For Design

Safety Evaluation No.:	24590-WTP-SE-ENS-04-0208	Rev. # 0
EDR No.:	24590-WTP-EDR-ENS-04-1547 and 1587	Rev. # 0

		YES	NO
	Basis: These changes do not result in more than a minimal decrease in the safety functions of ITS SSCs or change how a SDC/SC, SDS/SS SSC meets its respective safety function. Clearly, the addition of an ITS credited controls doe not negatively impact an SSC's safety function. Removing the Ammonia tank from HLW and adding the orifice will not decrease a safety function. Further, the reclassification/reduction in classification of an SSC to APC as a result of the DOE Std. 3009 ISM reclassifications will not result in a decrease in a credited SSC's safety function.		
5.	Does the change result in a noncompliance with applicable laws and regulations (i.e., 10 CFR 820, 830, and 835) or nonconformance with top-level safety standards (i.e., DOE/RL-96-0006)?	☐	☒
	Basis: These changes do not result in a noncompliance with applicable laws and regulations or nonconformance with top-level safety standards. 10 CFR 820 - Procedural Rules for DOE Nuclear Activities, set forth the procedural rules for conduct of persons involved in DOE nuclear activities, in particular to achieve compliance with DOE nuclear safety requirements. These change are not related to any compliance, violation, or enforcement issue, exemption from safety requirements, or reporting of supplier defective products or inaccurate or incomplete information. 10 CFR 830 - Nuclear Safety Management, requires establishment and maintenance of safety basis and classifies QA work process requirements applicable to standards and controls adapted to meet regulatory or contract requirements that may affect nuclear safety. This includes certain aspects of technical safety requirements (TSRs), reviewed safety questions, facility safety basis, facility safety classified SSCs, and the quality assurance program (QAP). These changes are consistent with the requirements of 10 CFR 830 for facility ITS SSCs. 10 CFR 835 - Occupational Radiation Protection, sets forth rules to establish radiation protection standards, limits, and program requirements for protecting individuals from radiation resulting form conduct of DOE activities. These changes do not change the radiation protection program or challenge any requirements of 10 CFR 835. 24590-WTP-SRD-ESH-01-001-02, Safety Requirements Document, Volume II - These changes do not affect the SRD. These changes are being made to implement the revised safety classification system based on DOE Standard 3009.		
6.	Does the change fail to provide adequate safety?	☐	☒
	Basis: These changes provide adequate safety to the extent that: • The specific changes to be authorized do not cause or threaten imminent danger to the workers, the public, or the environment from radiological, nuclear, or chemical hazards. • Changes conform to applicable laws and regulations, top-level standards, and principles and continue to maintain SRD safety criteria. These changes do not result in inadequate safety. These changes are not expected to significantly impact the safety of the public, colocated worker or the facility worker. The changes related to classification are associated with the implementation guidance of DOE Standard 3009. While the reclassification of components from SDS to APC may result in a decrease in reliability (see response to question 3) and subsequently negatively impact the Risk Goals, it is expected		